



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/537,523 | 07/19/2005 | Koichi Tanaka | 112857-455 | 3577 |
| 29175 7590 06/11/2008 BELI., BOYD & LLOYD, LLP P. O. BOX 1135 CHICAGO, IL 60690 | | | | |
| EXAMINER | | | | |
| SCULLY, STEVEN M | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 4132 | | | | |
| MAIL DATE | | DELIVERY MODE | | |
| 06/11/2008 | | PAPER | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/537,523

Applicant(s)

TANAKA ET AL.

Examiner

Steven Scully

Art Unit

4132

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 May 2008.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
4a) Of the above claim(s) 9-12 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-8 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 03 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date 08/11/2005
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Inventor's Patent Application
6) ☐ Other: _____

DETAILED ACTION

1. Applicant's election without traverse of Group I, Claims 1-8, in the reply filed on May 9, 2008 is acknowledged.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Regarding claim 3, the phrase "or the like" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "or the like"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Gamo et al (US5976725).

Regarding claims 1-3:

Gamo discloses a fuel cell mount apparatus comprising a fuel cell 1 capable of power generation by use of a fuel and air (Column 4, Lines 20-43) and an electronic

Art Unit: 4132

apparatus having said fuel cell mounted thereon and being operated by electric power outputted from said fuel cell. A DC/DC converter 504 is used in common for said fuel cell and said electronic apparatus (Figure 22; Column 17, Lines 10-23).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gamo et al (US5976725) as applied to claim 1 above, and further in view of Zhang et al (US2002/011335).

Regarding claim 4:

Gamo discloses the electronic apparatus has a plurality of drive sections requiring electric power: display 5011 and CPU 5012 and so on (Column 17, Lines 10-33).

Gamo does not disclose a plurality of power generation sections.

However, it is well known in the fuel cell art to use more than one unit cell in series or parallel to increase the voltage or current, respectively, as taught by Zhang. Zhang discloses stacking a membrane electrode assembly in various combinations to provide fuel cells with more or fewer reaction zones and membranes ([0043]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the plurality of power generation sections of the fuel cell stack of Zhang in the fuel cell of Gamo for the benefit of the providing the fuel cell with a higher voltage and/or current output.

Regarding claims 5-7:

Gamo is silent with regard to an electric power supply means for supplying electric power to a predetermined drive section of said plurality of drive sections.

Zhang discloses a fuel cell system for powering electronic devices used far below the surface of the water in downhole or subsea locations ([0037]). The art is analogous in that the fuel cell system of Zhang is used to power an electronic device. Zhang further discloses the system to have a hybrid power system comprising a fuel cell 802 and a battery 804 (Figure 14; [0078]). The fuel cell and rechargeable battery are "electrically connected to provide power across a load 806. ...When coupled with a battery 804, the fuel cell 802 does not need to generate the maximum power output required for a short duration peak load. This hybrid system 800 is particularly suitable for multiple level power consumption requirements where a majority of time an average

base level power requirement is needed and a relatively small amount of time there is a short-term peak power load. The rechargeable batteries 804 can be charged by the fuel cell 802 during the average power consumption periods and can be used to boost the output power during the high power consumption periods.

"The hybrid system 800 may be able to reduce the size, weight and cost of the total power system by enabling a smaller fuel cell 802, in conjunction with a battery 804, to provide a required power demand 806." ([0078-0079]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the drive sections of Gamo with the hybrid power system of Zhang for the benefit of reduction in size, weight and cost of the total power system by enabling a smaller fuel cell, in conjunction with a battery, to provide a required power demand. Further, one of ordinary skill in the art at the time of the invention would appreciate a difference would exist in the required load to operate the display versus the CPU. Thus a drive section having a larger load variation than those of the other drive sections of said plurality of drive sections would be supplied with power from the electric power supply means.

9. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takamura (US6421585) in view of Gamo et al (US5976725).

Regarding claim 1:

Takamura discloses an electronic apparatus 1 having a battery 21 mounted thereon and being operated by electric power outputted from said battery (Figure 1; Column 3, Lines 43-48).

Takamura does not disclose the power source to be a fuel cell.

Gamo discloses a fuel cell mount apparatus comprising a fuel cell 1 capable of power generation by use of a fuel and air (Column 4, Lines 20-43) and an electronic apparatus having said fuel cell mounted thereon and being operated by electric power outputted from said fuel cell. A DC/DC converter 504 is used in common for said fuel cell and said electronic apparatus (Figure 22; Column 17, Lines 10-23).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the fuel cell and DC/DC converter of Gamo as the power source system for the electronic apparatus of Takamura for the benefit of providing an environmentally friendly power supply that can realize a small-sized and lightweight power source usable for a long time (Column 16, Line 66-Column 17, Line 2).

Regarding claims 2-3:

The limitations of claims 2-3 are discussed above with regard to claim 1 (DC/DC converter).

10. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takamura (US6421585) and Gamo et al (US5976725) as applied to claim 1 above, and further in view of Zhang et al (US2002/011335).

Regarding claim 4:

Takamura further discloses actuators 23A-23N provided respectively at articulation joints of legs 4A-4D and other joints. The actuators 23A-23N are driven under control of electronic circuit installed within the body portion 3. The actuators are driven to produce movement of the electronic apparatus (Column 3, Lines 49-59). These actuators are a plurality of drive sections. It is appreciated that the power generation unit would supply power to the drive sections.

Takamura does not disclose a plurality of power generation sections.

However, it is well known in the fuel cell art to use more than one unit cell in series or parallel to increase the voltage or current, respectively, as taught by Zhang. Zhang discloses stacking a membrane electrode assembly in various combinations to provide fuel cells with more or fewer reaction zones and membranes ([0043]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the plurality of power generation sections of the fuel cell stack of Zhang in the fuel cell of Gamo for the benefit of the providing the fuel cell with a higher voltage and/or current output.

Regarding claims 5-7:

Takamura modified by Gamo is silent with regard to an electric power supply means for supplying electric power to a predetermined drive section of said plurality of drive sections.

Zhang discloses a fuel cell system for powering electronic devices used far below the surface of the water in downhole or subsea locations ([0037]). The art is analogous in that the fuel cell system of Zhang is used to power an electronic device. Zhang further discloses the system to have a hybrid power system comprising a fuel cell 802 and a battery 804 (Figure 14; [0078]). The fuel cell and rechargeable battery are "electrically connected to provide power across a load 806. ...When coupled with a battery 804, the fuel cell 802 does not need to generate the maximum power output required for a short duration peak load. This hybrid system 800 is particularly suitable for multiple level power consumption requirements where a majority of time an average base level power requirement is needed and a relatively small amount of time there is a short-term peak power load. The rechargeable batteries 804 can be charged by the fuel cell 802 during the average power consumption periods and can be used to boost the output power during the high power consumption periods.

"The hybrid system 800 may be able to reduce the size, weight and cost of the total power system by enabling a smaller fuel cell 802, in conjunction with a battery 804, to provide a required power demand 806." ([0078-0079]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the drive sections of Takamura with the hybrid power system of Zhang for the benefit of reduction in size, weight and cost of the total power system by enabling a smaller fuel cell, in conjunction with a battery, to provide a required power demand.

11. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takamura (US6421585) and Gamo et al (US5976725) as applied to claim 1 above, and further in view of Roth (US6522096).

Regarding claim 8:

Takamura does not disclose the electronic apparatus having a plurality of drive sections and said fuel cell has the same number of power generation sections as the number of said plurality, said power generation sections disposed respectively in the vicinity of said drive sections, and said drive sections are supplied with electric power respectively from the corresponding power generation sections.

Roth discloses a control circuit for a robot power supply. As discussed by Roth, a single power supply is disadvantageous in that high cabling expenditure is involved. Also, electromagnetic and line-linked disturbances or interference cannot be excluded and must be considered. Further, high costs are involved for cooling and safety assurance (Column 1, Lines 19-43). In addressing these problems, each motor of an installation having several motors is provided with its own driver unit. As a result of the subdivided design of the power supply through the use of individual driver units for each motor, it is possible to position the individual driver units close to the mechanism, and in particular close to the individual motors associated therewith. This results in minimum cabling costs as well as significant reduction in electromagnetic and line-linked interference. Further, the costs for cooling and assuring the necessary safety are kept low (Column 1, Lines 45-67). It is noted that the power supply device is the modular drivers 4.1-4.6 for each motor 1.1-1.6 (Figure 1; Column 4, Lines 29-31). In the case of

Roth, the plurality of drive sections are the motors 1.1-1.6 and the same number of power generation sections are the drive units 4.1-4.6.

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a plurality of drive sections with a plurality of power generation sections disposed in the vicinity of said drive sections for supplying electric power respectively from the corresponding power generation sections to the drive sections for the benefit of reducing cabling expenditure, electromagnet and line-linked disturbances or interference and costs for cooling and safety assurance as discussed above (Column 1, Lines 19-67).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sakamoto et al (WO01/32366, translated by US6505098) is drawn to a robot dog. Yamamoto (US6330494) is drawn to a robot dog (especially of note is Figure 1 detailing the motors of said robot dog.)

Contact/Correspondence Information

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Scully whose telephone number is (571)270-5267. The examiner can normally be reached on Monday to Friday 7:30am to 5pm.

Art Unit: 4132

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on (571)272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. S./
Examiner, Art Unit 4132

/Jessica L. Ward/
Supervisory Patent Examiner, Art Unit 4132